UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
OSB1997-0694

February 4, 1997

Mr. Dave Reilly
Assistant Division administrator
Federal Highway Administration
Oregon Division
The Equitable Center, Suite 100
530 Center Street NE
Salem, Oregon 97301

Re: Biological Opinion on Ongoing and Proposed (through 4/31/97) Actions affecting Umpqua River Cutthroat Trout.

Dear Mr. Reilly:

Enclosed is the National Marine Fisheries Service's (NMFS) biological opinion (opinion) on ongoing and proposed actions by the Oregon Department of Transportation affecting Umpqua River cutthroat trout. The Opinion applies to actions through 4/31/97 . The NMFS has determined the proposed activity is not likely to jeopardize the continued existence of Umpqua River cutthroat trout. These finding are primarily based on the fact that although the proposed actions would cause minor, short term degradation to some essential habitat elements, these adverse impacts are not expected to reduce prespawning survival, egg-to-smolt survival, or upstream/downstream migration survival rates to a level that would appreciably diminish the likelihood of survival and recovery of Umpqua River cutthroat trout.

The NMFS believes that any incidental take that is likely to occur as a result of these actions has been adequately minimized by project design and mitigation. Therefore, reasonable and prudent alternatives to further reduce incidental take are not necessary.

Sincerely,

William Stelle, Jr.
Regional Administrator

Enclosure

cc: P. Dykman (ODOT)
B. Falkenstein (FHWA)

Endangered Species Act - Section 7 Consultation

BIOLOGICAL OPINION

Ongoing and Proposed (through 4/31/97) Actions Affecting Umpqua River Cutthroat Trout

Agency: Oregon Department of Transportation

Consultation Conducted By: National Marine Fisheries Service, Northwest Region

Date Issued: February 4, 1997

Refer to: OSB1997-0694

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I. Background

The Umpqua River cutthroat trout (*Onchorynchus clarki clarki*) was listed as endangered under the Endangered Species Act (ESA) by the National Marine Fisheries Service (NMFS) on August 9, 1996 (61 FR 41514; August 9, 1996). This evolutionarly significant unit (ESU) includes anadromous, potamodromous, and resident cutthroat trout populations occurring below natural barriers in the Umpqua Basin. A biological assessment (BA) describing the effects of ongoing and proposed actions through April, 1997, on Umpqua River cutthroat trout has been submitted to NMFS by the Oregon Department of Transportation (ODOT). The ODOT is the designated non)Federal representative for transportation related actions in Oregon that are funded by the Federal Highway Administration. In addition, an addendum was provided describing annual road maintenance activities through April, 1997.

The BA and addendum describe 16 proposed and ongoing actions that may affect Umpqua River cutthroat trout. For this opinion, all maintenance activities are considered one action. The BA separated "may affect" actions into two determination categories: 1) actions that may affect, but are not likely to adversely affect Umpqua River cutthroat trout (NLAA), and 2) actions that may affect, and are likely to adversely affect Umpqua River cutthroat trout (LAA). The ODOT determined that four of their proposed and ongoing activities including maintenance are LAA actions and the remaining 12 are NLAA actions.

The objective of this biological opinion is to determine whether the four ongoing and proposed actions through April, 1997, by ODOT are likely to jeopardize the continued existence of Umpqua River cutthroat trout. For effects determinations, ODOT employed a method suggested by NMFS for evaluating current aquatic conditions (the environmental baseline) and predicting effects of actions on them. This process is described in the document "Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale" (NMFS 1996). Critical habitat has not been proposed or designated for the Umpqua River cutthroat trout. Therefore, this opinion does not address destruction or adverse modification of critical habitat but does consider effects on factors that define properly functioning aquatic habitat. The 12 NLAA actions are not addressed in this opinion. The NMFS concluded informal consultation on the 12 NLAA actions with a concurrence letter dated September 9, 1996.

II. Proposed and Ongoing Actions

The proposed and ongoing actions are listed in Table 1. The action area is defined as the Umpqua River Basin, which stretches from the crest of the Cascade Mountains to the Pacific Ocean and encompasses approximately 3,000,000 acres. The Umpqua River Basin is comprised of the mainstem Umpqua, the North Umpqua, and the South Umpqua subbasins, each having unique physiographic features (Johnson et al. 1994). The mainstem Umpqua subbasin consists of all watersheds downstream of the confluence of the North and South Umpqua Rivers, including the Smith River, Elk Creek, and Calapooya Creek watersheds. The physiographic features are defined as the Tyee Sandstone (includes the lower Umpqua River and tributaries), Interior Valley (includes portions of the North and South Umpqua Rivers, their junction with the mainstem Umpqua River and related tributaries), Western Cascades and High Cascades (includes the upper portions of the North and South Umpqua Rivers and tributaries) physiographic provinces.

Table 1. Proposed and ongoing actions through April, 1997.

Smith River Bridge Replacement (Key No. 05358)) *proposed*
Ollala Creek Bridge)Hoover Hill Road (Key No. 06930)) *ongoing*
Pass Creek Slide Mitigation (Key No. 07384)) *ongoing*
Maintenance Activities) *ongoing*

Smith River Bridge Replacement

The proposed action would occur within the Tyee Sandstone physiographic province on Coast Highway 101, south of Gardiner, Douglas County, Oregon. The ODOT proposes to replace the existing two)lane bridge with a four)lane structure. A conference report was completed for the proposed action in a letter dated August 31, 1995, from William Stelle, Jr., NMFS, to Pieter Dykman, ODOT. This opinion supersedes the August 31, 1995, conference report.

Two phases are planned for this action. Phase one would include
1) constructing a two)lane bridge east of the existing bridge over the Smith River; 2) improving and widening the bridge over the Longview, Portland and Northern Railroad tracks; 3) improving the Lower Smith River Road intersection with Highway 101; and 4) removing the existing bridge. Construction would begin in 1997 and is scheduled to be completed in 1999.

Phase two would include 1) widening the new Smith River Bridge from two lanes to four lanes, 2) widening Highway 101 from the south of Gardiner to the Smith River Bridge from two to four lanes, and 3) adjusting the Lower Smith River Road intersection for the four)lane bridge. Phase two has not been scheduled but is expected to occur within the next ten years. This opinion addresses phase one of this proposed action.

The existing two)lane bridge is supported by 57 wooden piers and the proposed four)lane structure would be supported by 13 steel piers (each pier consisting of four to five piles). A temporary work bridge supported by 25)50 piers would be constructed 3)4 feet upstream of the existing bridge. A pile hammer attached to a crane, operating from the bank and work bridge, would be used to set piles. Approximately 543,000 cubic yards of material would be excavated to accomplish the proposed realignment. Excess material would be disposed in a ravine located on International Paper Company property on the Old Smith River Road. Less than one acre of wetland would be filled and a new culvert would be placed south of the exiting culvert at STEP Creek with fish passage provided.

Construction staging areas have not been established but would not be located near the water course. The ODOT has proposed that staging occur at the Willamette Industries property on Bolon Island, approximately 1,500 feet away from the Smith River. The asphalt batching plant would be located outside of the project area.

Upon completion of the new bridge, the existing structure and work bridge would be removed. All pilings associated with the existing bridge and work bridge would be broken at the base or cut off at the sediment/water interface.

For the Umpqua/Smith River estuary, in)stream work would be conducted from October 1 through January 15 of each calander year until phase one is completed. For STEP creek, in)stream work would be conducted from July 1 through September 15 of each calander year until phase one is completed. In)stream work would be accomplished during ebb tide to expedite flushing of suspended sediments downstream. Work in STEP Creek would be conducted in the dry.

Ollala Creek Bridge)Hoover Hill Road

This is an ongoing action located in the Interior Valley physiographic province about 5 miles west of Winston, Douglas County, Oregon. Approximately 2 miles of Oregon Highway 42 would be realigned and the existing bridge over Ollala Creek is being widened. This action would take about two construction seasons to complete.

Between 20 and 30 temporary structures would be placed in Ollala Creek to support the existing bridge while it is being widened. After widening is completed these structures would be removed with four new support columns remaining in the creek. Riprap would be installed from the creek bed up to the 50)year floodplain from below the bridge extending 50 feet along the southeast and northwest fill slopes. In-water work would be accomplished between July 1 and September 15.

Pass Creek Slide Mitigation

This ongoing action will be located in the Tyee Sandstone physiographic province roughly 8 miles northeast of Curtin on Interstate)5, Douglas County, Oregon. The ODOT will correcting a slide adjacent to Pass Creek that has deformed the freeway in both directions of travel.

The slope will be dewatered by drilling catchments and draining the hillside. Installation of the drilling equipment, including construction of access roads, will require removal of saplings and pole)stage trees and roughly 2,690 square feet of understory. Drainage will be free of sediment and disturbed areas will be replanted. One large tree removed from the project site will be placed in a scour pool of Pass Creek to decrease bank sloughing and create salmonid habitat. An existing dirt road in the riparian

corridor will be decommissioned and planted with native species. The only in-stream activity associated with this action would be the placement of one tree in Pass Creek.

Maintenance Activities

Maintenance operations typically result from storm events or other unpredictable incidents. The number and extent of maintenance operations that may occur through April, 1997, are unforseeable and difficult to quantify. Therefore, the addendum provides a description of each kind of maintenance activity that ODOT typically performs in the Umpqua River basin in any given year (see Table 2). The addendum also includes measures that ODOT would implement to minimize or avoid impacts to the listed and proposed species. Maintenance activities are likely to occur in all four physiographic provinces. In-stream activities that may occur would be conducted during Oregon Department of Fish and Wildlife (ODFW) approved work windows.

Table 2. Maintenance activities grouped by 1) in)water work, 2) removal of riparian vegetation, and 3) effects on water quality.

Maintenance Activities:

1. In)water Work
   - Culvert and Inlet Cleaning
   - Culvert and Inlet Repair
   - Miscellaneous Hand and Minor Repair
   - Channel Maintenance
   - Bridge Maintenance
   - Bridge Repair
   - Other Structure Maintenance

2. Removal of Riparian Vegetation
   - Mowing
   - Brush Mowing
   - Brush Cutting by Hand
   - Bridge Maintenance
   - Other Vegetation Management) Danger Trees and Destabilizing Trees

3. Effects on Water Quality
   - Surface/Shoulder Work
   - Asphalt Plant Production
   - Shoulder Blading
   - Sweeping/Flushing
   - Ditch Work
   - Erosion Repair
   - Spraying
   - Accident Cleanup
   - Guardrail Replacement
   - Bridge Maintenance
   - Removal of Snow and Ice from Roadway Surfaces and Sanding
   - Emergency Maintenance
   - Settlements/Slides
   - Administrative Service) StockPiling Material

III. Biological Information and Critical Habitat

The listing status and biological information for Umpqua River cutthroat trout are described in Attachment 1. Although critical habitat has not been proposed or designated, Attachment 1 describes potential critical habitat elements for Umpqua River cutthroat trout.

IV. Evaluating Proposed Actions

The standards for determining jeopardy are set forth in Section 7(a)(2) of the Endangered Species Act (ESA) as defined by 50 CFR Part 402. Attachment 2 contains a discussion of how NMFS conducts an analysis applicable to the standards for the listed Umpqua River cutthroat trout.

As described in Attachment 2, the first steps in applying the ESA jeopardy standards are to define the biological requirements of Umpqua River cutthroat trout and to describe the current status of the listed species as reflected by the environmental baseline. The NMFS' jeopardy analysis considers how proposed actions are expected to directly and indirectly affect specific habitat elements essential for the survival and recovery of the species. This analysis is set within the dual context of the species' biological requirements and the existing conditions under the environmental baseline (defined in Attachment 1). The analysis takes into consideration an overall picture of the beneficial and detrimental activities taking place within the action area. If the cumulative actions are found to jeopardize the listed species, then NMFS will identify and designate any available reasonable and prudent alternatives for the proposed action.

A. Biological Requirements

For this consultation, NMFS finds that the biological requirements of Umpqua River cutthroat trout are best expressed in terms of environmental factors that define properly functioning aquatic habitat necessary for survival and recovery of the ESU. Individual environmental factors include water quality, habitat access, physical habitat elements, channel condition, and hydrology. Properly functioning watersheds, where all of the individual factors operate together to provide healthy aquatic ecosystems, are also necessary for the survival and recovery of Umpqua River cutthroat trout. This information is summarized in Attachment 1.

B. Environmental Baseline

Current range-wide status of ESU under environmental baseline

NMFS described the current population status of the Umpqua River cutthroat trout ESU in its status review (Johnson et al. 1994) and in the final rule (August 9, 1996, 61 FR 41514). The fish counts at Winchester Dam on the North Fork Umpqua River provide the best quantitative source of cutthroat trout

abundance in the Umpqua River Basin (see Attachment 1, Table 1). It is difficult to determine the population status for the environmental baseline assessment of the entire ESU based on Winchester Dam fish counts alone. In the absence of adequate population data, habitat condition provides a means of evaluating the status of Umpqua River cutthroat trout for the environmental baseline assessment, as explained in Attachment 1.

Current status of ESU under environmental baseline within the action area

The environmental baseline conditions were evaluated for all actions at the site, subbasin and basin)wide scales. This evaluation was based on the "matrix pathways and indicators" described in NMFS (1996). This method assesses the current condition of instream, riparian and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species.

Based on the best information available on the current status of Umpqua River cutthroat trout (Attachment 1), NMFS' assumptions using the information available regarding population status, population trends and genetics (Attachment 2), and the environmental baseline conditions within the action area, NMFS concludes that the biological requirements of Umpqua River cutthroat trout are currently not being met under the environmental baseline within the action area. Significant improvement in habitat condition is needed to meet the biological requirements for survival and recovery of the species. Actions that do not maintain or restore properly functioning aquatic habitat conditions would be likely to jeopardize the continued existence of Umpqua River cutthroat trout due to the high level of risk Umpqua River cutthroat trout presently face under the degraded environmental baseline.

V. Analysis of Effects

A. Effects of Proposed Action

The effects determinations in the BA were made using a method for evaluating current aquatic conditions (the environmental baseline) and predicting effects of actions on them. This process is described in NMFS (1996). This assessment method was designed for the purpose of providing adequate information in a tabular form for NMFS to determine the effects of actions subject to consultation. The effects of actions are expressed in terms of the expected effect (restore, maintain, or

degrade) on each of the aquatic habitat factors in the project area, as described in NMFS (1996).

The results of the completed checklist for each action provide a basis for determining the overall effect of the action on the environmental baseline in the project area. All actions covered in this opinion were shown to maintain the environmental factors that could potentially be affected by each of the projects. The ODOT further indicated where an action could have a short)term impact on an environmental factor but would continue to maintain the existing environmental baseline. For example, NMFS has identified sediment as one environmental indicator or factor that is affected by actions and is one element of the environmental baseline that affects aquatic species. Sediment inputs to the lower Smith River would occur from the proposed Smith River Bridge replacement due to installation and removal of pilings and stream bank excavation work. With implementation of measures to reduce sediment inputs, it is expected that the existing environmental baseline (with regard to sediment loads in the lower Smith River) would be maintained and not further degraded. Nevertheless, short)lived adverse effects such as temporary increases in sediment have the potential to result in low levels of incidental take.

In)water work associated with the proposed and ongoing actions include installation and removal of piles, placement of temporary support structures (braces), construction of earthen berms, placement of riprap, and installation of a large tree. It is anticipated that some unknown number of listed adult Umpqua River cutthroat trout would be present during in)stream work. Construction activities would be limited to time periods prescribed by the ODFW. The ODFW limits instream work to periods of low flow, which allows a great deal of work to be accomplished in the dry or during intervals that minimize or avoid impacts during important spawning and migration periods.

1. Water Quality

NMFS (1996) identifies water temperature, sediment, and chemical contamination/nutrient loading as factors affecting water quality. The proposed and ongoing activities are expected to maintain the current temperature, sediment, chemical contaminant, and nutrient load regimes of watersheds in the Umpqua Basin; and are not expected to preclude properly functioning conditions with regard to water quality.

a. Temperature

Factors influencing stream temperatures that are typically affected by human activities are stream discharge, channel morphology and vegetative cover. Reduction in flow can increase temperatures in the summer and decrease temperatures in the winter. Removal of stream)side vegetation reduces shade which can also increase summer and decrease winter temperatures. Destabilization of the stream bank also occurs from vegetation removal. This can influence channel morphology by eroding banks and widening streams which again can increase summer and decrease winter stream temperatures (Rhodes et al 1994).

Some riparian vegetation would be removed during the proposed and ongoing actions. Removed vegetation would be replanted with native species. No changes in stream discharge would occur. There would be some minor changes in stream morphology with the addition of rip rap but these are not expected to degrade the current baseline regarding stream temperatures.

b. Sediment and Turbidity

Short)term increases in turbidity are expected to occur from instream activities. Releases of fine sediment degrade salmonid spawning and rearing habitat (Chapman and McLeod 1987, Bjornn and Reiser 1991). Sediment deposition in interstitial spaces increases cobble embeddedness, decreasing the carrying capacity of streams for rearing juvenile salmonids by reducing cover and macroinvertebrate production (Bjornn et al 1977). Furthermore, temporary turbidity plumes may alter feeding and territorial behavior (Berg and Northcote 1985).

Releases of sediment and resultant increases in turbidity would be temporary and localized and are not expected to degrade the environmental baseline or preclude the attainment of properly functioning conditions. The collection of erosion control measures proposed by ODOT are expected to maintain the current environmental baseline. Erosion control measures include silt fencing, hay bale placement and construction of catchment basins at the bottom of newly exposed slopes. Erosion control seeding and mulching would occur on bare soil exposed by construction activities.

c. Chemical Contaminants

Hazardous materials such as petroleum products could potentially enter the water. This could result in mortality

to listed and proposed species. Measures have been taken by ODOT to reduce this risk to a minimum. These measures include development of site)specific Spill Prevention Control and Countermeasure Plans, establishment of 24)hour emergency response teams, and washing petroleum products (oil, fuel and grease) from construction equipment. Wash water would not enter streams. No storage or transfer of petroleum products to construction equipment would occur within 150 feet of stream channels.

2. Habitat Access

No changes are expected to occur with regard to habitat access. ODOT would continue to maintain fish passage culverts where appropriate. Placement of temporary and new piers associated with the Smith River Bridge and Olalla Creek Bridge are not expected to inhibit access.

a. Construction Noise

Salmonids can detect sound frequencies generated by pile driving within a radius of 300 meters (Feist 1992). Pile driving activities may result in delay (holding until pile driving ceases) or avoidance (movement towards the opposite side of the river before movement upstream or downstream). These behavioral responses could provoke fish to flee from feeding and shelter areas or alter territorial behavior. The proposed instream construction windows prescribed by ODFW is expected to reduce impacts to migration and spawning behavior. The potential exists for instream activities to alter territorial behavior and provoke fish to flee from feeding and shelter areas.

3. Physical Habitat Elements

Habitat elements identified by ODOT that have the potential to be affected by the proposed and ongoing actions are substrate, large woody debris, pool frequency, pool quality and off)channel habitat. The current baseline regarding these elements is expected to be maintained. Some off)channel habitat loss would occur in Olalla Creek. ODOT would create two new off)channel rearing areas for mitigation. The action associated with Pass Creek requires the removal of hillside vegetation. One of the large trees removed would be placed in Pass Creek to provide cover for salmonids.

4. Channel Condition and Hydrology

NMFS (1996) identifies width/depth ratio, streambank stability, and floodplain connectivity as factors affecting channel condition; and peak/base flow and drainage network as factors affecting hydrology. The proposed and ongoing actions would maintain the current baseline regarding these factors and is not expected to preclude attainment of proper function regarding these factors. Nevertheless, short term adverse effects on stream bank stability could result from removal of vegetation and excavation of stable soils.

B. Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." For the purposes of this analysis, the action area encompasses the Umpqua River basin. Future Federal actions, including the ongoing operation of hatcheries, fisheries, and land management activities are being (or have been or will be) reviewed through separate Section 7 consultation processes.

Federally managed lands comprise roughly 47 percent of the Umpqua River basin. The remaining 53 percent is made up of state, county and private land consisting primarily of agricultural and forestry land. The majority of spawning and rearing habitat for the Umpqua River cutthroat trout occurs on Federally managed lands. A small but rapidly growing percent of non-Federal land is being used for urban growth and expansion.

Historically, agriculture, livestock grazing, forestry and other activities on non-federal land in the Umpqua River Basin have contributed substantially to temperature and sediment problems in the Umpqua River Basin. Conditions on, and activities within, non-Federal riparian areas along stream reaches downstream of Federally managed lands presently exert a greater influence on river temperatures and may contribute more sediment to the habitat of Umpqua River cutthroat trout than Federal activities (USDA 1995; USDI 1995a,b,c).

Significant improvement in Umpqua River cutthroat trout reproductive success outside of Federally managed lands is unlikely without changes in agricultural, forestry, and other practices occurring within these non-Federal riparian areas in

the Umpqua River basin. NMFS is not aware of any future new or changes to existing state and private activities within the action area that would cause greater impacts to listed species than presently occurs. For actions on non-Federal lands which the landowner or administering non-Federal agency believes are likely to result in adverse effects to Umpqua River cutthroat trout or their habitat, the landowner or agency should work with NMFS to obtain a section 10 incidental take permit, which requires submission of a habitat conservation plan. If a take permit is requested, NMFS would likely seek project modifications to avoid or minimize adverse effects and taking of listed fish. Until improvements in non-Federal land management practices are actually implemented, NMFS assumes that future private and State actions will continue at similar intensities as in recent years.

VI. Conclusion

The NMFS has determined that the proposed and ongoing actions as described in the August 20, 1996, BA and September 9, 1996, addendum are not likely to jeopardize the continued existence of Umpqua River cutthroat trout. In applying the jeopardy analysis (described in attachment 2), NMFS used the best available scientific and commercial data. Effects on the biological requirements of the species relative to the environmental baseline (described in attachment 1), taken together with cumulative effects, were considered.

The NMFS determined that the survival and recovery of Umpqua River cutthroat trout life forms within subpopulations that comprise the ESU can be assured by providing sufficient prespawning survival, egg-to-smolt survival, and upstream/downstream migration survival rates through the protection and restoration of properly functioning freshwater habitat.

NMFS applied its evaluation methodology (NMFS 1996) to the proposed and ongoing actions listed in Table 1, and found that the proposed actions would cause minor, short-term adverse degradation to some essential habitat elements. However, adverse habitat effects from the proposed and ongoing actions is not expected to reduce prespawning survival, egg-to-smolt survival, or upstream/downstream migration survival rates to a level that would appreciably diminish the likelihood of survival and recovery of Umpqua River cutthroat trout.

VII. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. The NMFS believes the following conservation recommendations are consistent with these obligations, and therefore should be implemented by the Federal Highway Administration and ODOT:

1. ODOT should conduct monitoring at all riparian revegatation sites to ensure 80 percent survival of replanted species after the second growth season.

2. Sites where seeding and mulching, hay bale placement, silt fencing or other methods employed to control erosion of exposed slopes should be monitored for effectiveness and to ensure proper function at all times.

3. ODOT should develop a monitoring strategy to assess potential effects on the aquatic environment from removal of snow and ice from roadway surfaces and sanding.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or its habitat, NMFS requests notification of the implementation of any conservation recommendations.

VIII. Reinitiation of Consultation

Consultation must be reinitiated if: the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect the listed species in a way not previously considered; the action is modified in a way that causes an effect on the listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

IX. References

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this opinion.

Berg, L. and T. G. Northcote. 1985. Changes in territorial, gill)flarring, and feeding behavior in juvenile coho salmon (*Oncorhynchus kisutch*) following short)term pulses of suspended sediment. In: Meehan, W.R. (ed.). Influences of forest and rangeland management on salmonid fishes and their habitats. Canadian Journal of Fisheries and Aquatic Sciences 42:1410)1417.

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Bjornn, T.C. and Reiser D.W. 1991. Habitat requirements of salmonids in streams. p. 83-138. In: Meehan, W.R. (ed.). Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publ. 19.

Chapman, D.W. and K.P. McLeod. 1987. Development of criteria for fine sediment in the Northern Rockies Ecoregion. Work assignment 2-73. Battelle Columbus Laboratories. EPA Contract No. 68-01-6986.

Feist, B.E. 1992. Potential Impacts of Pile Driving on Juvenile Pink (*Oncorhynchus gorbuscha*) and Chum (*O. keta*) Salmon Behavior and Distribution. 23p.

Johnson, O.W., R.S. Waples, T.C. Wainwright, K.G. Neely, F.W. Waknitz, and L.T. Parker. 1994. Status review for Umpqua River sea-run cutthroat trout. U.S. Dep. Commer., NOAA. Tech. Memo. NMFS-NWFSC-15, 122 p.

Rhodes, J.J., D.A. McCullough and F.A. Espinosa, Jr. 1994. A course screening process for potential application in ESA consultations. Technical report prepared for the National Marine Fisheries Service. Available from the Columbia Inter-Tribal Fish Commission, 729 N.E. Oregon Street/Suite 200, Portland, Oregon 97232.

NMFS (National Marine Fisheries Service). 1996. Making Endangered Species Act determinations of effect for individual or grouped actions at the watershed scale. Unpublished report. National Marine Fisheries Service, Environmental and Technical Services Division, 525 N.E. Oregon Street/Suite 500, Portland, Oregon 97232.

USDA (U.S. Dept. of Agriculture, Forest Service). 1995. Little River watershed analysis, Umpqua National Forest. Version 1.1 plus appendices.

USDI (U.S. Dept. of the Interior, Bureau of Land Management). 1995a. Paradise Creek watershed analysis, Coos Bay BLM District.

USDI (U.S. Dept. of the Interior, Bureau of Land Management). 1995b. Canton Creek watershed analysis, Roseburg BLM District.

USDI (U.S. Dept. of the Interior, Bureau of Land Management). 1995c. West Fork Cow Creek watershed analysis. Medford BLM District.

X. Incidental Take Statement

Sections 4(d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. If necessary, it also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

A. Amount or Extent of Take

The NMFS anticipates that the actions covered by this Biological Opinion (Table 1) have more than a negligible likelihood of resulting in incidental take of Umpqua River cutthroat trout because of detrimental effects on aquatic habitat parameters including turbidity, suspended sediment levels, slope stability and habitat access by means of sound waves generated by pile driving, all of which directly affect their life history. Because of the inherent biological characteristics of aquatic species such as Umpqua River cutthroat trout, however, the likelihood of discovering take attributable to these actions is very small. Effects of actions such as these are largely unquantifiable in the short term, and are not expected to be measurable as long-term effects on the species' habitat or population levels. Therefore, even though NMFS expects some low level of incidental take to occur due to the actions covered by this Biological Opinion, the best scientific and commercial data

available are not sufficient to enable NMFS to estimate a specific amount of incidental take to the species itself. In instances such as these, the NMFS designates the expected level of take as "unquantifiable."

Based on the information in the BAs, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the actions covered by this Biological Opinion. To ensure protection for a species assigned an unquantifiable level of take, reinitiation of consultation is required: (1) if any action is modified in a way that causes an effect on the listed species that was not previously considered in the BAs and this Biological Opinion; (2) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; or (3) a new species is listed or critical habitat is designated that may be affected by the action (50 C.F.R. 402.16).

B. Reasonable and Prudent Measures

NMFS believes that the incidental take of Umpqua River cutthroat trout that is likely to occur as a result of the actions included in the Biological Opinion has been adequately minimized by project design and mitigation. Therefore reasonable and prudent measures to further reduce this incidental take are not necessary.